

MICroneedle DEVICES AND MICroneedle DELIVERY APPARATUS

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ABSTRACT OF THE DISCLOSURE

Microneedle devices with microneedles having a truncated tapered shape are disclosed. The microneedles of microneedle devices may also have a controlled aspect ratio. Microneedle delivery apparatus are disclosed that include drivers designed to deliver 10 microneedles at velocities that may enhance perforation of the stratum corneum while limiting the sensation of pain experienced at the delivery site.